

The Effects of Interstellar Neutrals on the Structure and Dynamics of the Global Heliosphere

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Interstellar neutrals interact strongly with the solar wind plasma at the boundaries of the heliosphere via charge exchange collisions. We present results from modeling this interaction using a two-dimensional time-dependent axisymmetric numerical model of the global heliosphere. Both the neutrals and the plasma are treated as fluids which are coupled via charge exchange collisions and which evolve self-consistently. Using the best estimates of the interstellar parameters, we find that the interaction of the solar wind plasma with the interstellar neutrals leads to a significant reduction in the size of the heliosphere as has been seen previously by others.

This plasma-neutral model has been used to study the propagation of an interplanetary shock to the heliopause which has been modeled previously by Steinolfson and Gurnett (1995) as a possible trigger for the Voyager 3 kHz radio emission. We have extended these calculations and find that the interstellar plasma density, observed emission cut-off frequency and heliopause location can all be made consistent once the effect of the reduction in the size of the heliosphere by the interaction with the neutrals is included.

Steinolfson, R. S. and Gurnett, D., *Geophys. Res. Lett.* 22, 651(1995)

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